

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of:

Applicant : Li-Ying Yang
Appln. No. : 10/798,595
Filed : March 11, 2004
Title : MECHANICALLY EMBOSSED SINGLE PLY ROOFING
MEMBRANE FOR ANTI-ROLL BLOCKING
Docket No. : FDN-2795
Art Unit : 3635
Examiner : Basil S. Katcheves

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Sir:

APPEAL BRIEF

This is an Appeal from the Final Rejection dated October 10, 2008. A timely Notice of Appeal was submitted by Appellants and was received by the United States Patent and Trademark Office on April 10, 2009.

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(i) Real Party In Interest

Applicant, Li-Ying Yang, has assigned this application to Building Materials Investment Corporation. A copy of the Assignment was recorded in the United States Patent and Trademark Office at Reel 015086, Frame 0077, on March 11, 2004. Accordingly, Building Materials Investment Corporation is the real party in interest.

(ii) Related Appeals and Interferences

Appellants' legal representatives and the Assignee are not aware of any other Appeals or Interferences that would be directly affected by/or have a bearing on the Board's Decision in the pending Appeal.

(iii) Status of Claims

Claims 1-31 remain in this application. Claims 2-4, 6, 7, 19-21, 23 and 24 have been withdrawn. Claims 1, 5, 8-18, 22, and 25-31 stand rejected. The appealed claims are claims 1, 5, 8-18, 22, and 25-31.

(iv) Status of Amendments

An amendment was filed on December 10, 2008, subsequent to the Final Rejection mailed on October 10, 2008. According to the Advisory Action, the amendment was not entered. Appellants note that the proposed amendment simply presented arguments without amending any claims. Therefore, it is unclear why the amendment would not have been entered.

(v) Summary of Claimed Subject Matter

The claims on appeal are directed to a mechanically embossed single ply roofing membrane. The membrane includes a top layer and a bottom layer wherein the bottom layer is mechanically embossed forming an embossment of alternating ridges and valleys over a majority of the surface of the bottom layer.

Independent claim 1 can be mapped out as follows:

1. A mechanically embossed (Title, Abstract) single ply roofing membrane (p. 3, ll. 6-7 and Figs. 1-18, part 10) comprising: a top layer (p. 3, ll. 7-8 and Figs. 1-13, 15, 16 and 18, part 14) and a bottom layer (p. 3, ll. 7-9, Figs. 1-15, 17, 18, part 16) permanently pressed into a single ply membrane (p. 3, ll. 8-9) wherein said bottom layer is mechanically embossed (Title, Abstract) forming an embossment of alternating ridges (Figs. 1-3, part 22, Figs. 4-6, part 26, Figs 7-9, part 32, Figs. 10-12, part 38, Figs. 13-15, part 44, Figs. 16-18, part 50, p. 7, l. 9 – p. 8. l. 15) and valleys (Figs. 1-3, part 20, Figs. 4-6, part 28, Figs 7-9, part 34, Figs. 10-12, part 40, Figs. 13-15, part 46, Figs. 16-18, part 52, p. 7, l. 9 – p. 8. l. 15) over a majority of the surface area of the bottom layer (p. 2, ll. 26-29, p. 3, ll. 1-2, Figs. 1-18).

Independent claim 10 can be mapped out as follows:

10. A mechanically embossed (Title, Abstract) single ply roofing membrane (p. 3, ll. 6-7, and Figs. 1-18, part 10) comprising: a reinforcement scrim sandwiched between (p. 3, l. 14, Figs. 1-18, part 12) a top layer of polyolefin (p. 3, l. 13) and a bottom layer of polyolefin (p. 3, l. 13) permanently pressed into a single ply membrane (p. 3, ll. 8-9) wherein said bottom layer is mechanically embossed (Title, Abstract) forming an embossment of alternating ridges (Figs. 1-3, part 22, Figs. 4-6, part 26, Figs 7-9, part 32, Figs. 10-12, part 38, Figs. 13-15, part 44, Figs. 16-18, part 50, p. 7, l. 9 – p. 8. l. 15) and valleys (Figs. 1-3, part 20, Figs. 4-6, part 28, Figs 7-9, part 34, Figs. 10-12, part 40, Figs. 13-15, part 46, Figs. 16-18, part 52, p. 7, l. 9 – p. 8. l. 15) over a majority of the surface area of the bottom layer (p. 2, ll. 26-29, p. 3, ll. 1-2, Figs. 1-18).

Independent claim 26 can be mapped out as follows:

26. A method of making a mechanically embossed reinforced single ply roofing membrane (p. 8, ll. 23-25) comprising:

providing a scrim or reinforcement sheet having top and bottom surfaces (p. 2, ll. 11-12; Figs. 1-18);

depositing a coating in a molten state on said top and bottom surfaces of said scrim or reinforcement sheet (p. 2, ll. 12-14);

embossing said bottom surface with a pattern of ridges and valleys (p. 4, ll. 7-12, p. 7, l. 9 – p. 8, l. 15, and Figs. 1-18) over a majority of the surface area of the bottom layer (p. 2, ll. 26-29, p. 3, ll. 1-2, Figs. 1-18); and

solidifying the molten coating on the top and bottom surfaces of said scrim or reinforcement sheet (p. 2, ll. 16-17). Support is also provided by original claim 26.

Independent claim 27 can be mapped out as follows:

27. A method of making a mechanically embossed (Title, Abstract) non-reinforced single ply roofing membrane (p. 3, ll. 6-10) comprising:

extruding and calendering a molten polyolefin sheet (p. 8, ll. 23-26)

embossing a majority of the bottom surface (p. 2, ll. 26-29, p. 3, ll. 1-2, Figs. 1-18) of said non-reinforced sheet with a pattern of ridges and valleys (p. 4, ll. 7-12, p. 7, l. 9 – p. 8, l. 15, and Figs. 1-18); and

solidifying the molten non-reinforced sheet (p. 2, ll. 16-17). Support is also provided by original claim 27.

(vi) Grounds of Rejection to be Reviewed on Appeal

(A) Claims 1, 8, 10, 12, 13, 15 and 25 stand rejected on the ground of non-statutory obviousness-type double patenting as being unpatentable over claim 1 of U.S. Patent No. 6,544,909.

(B) Claims 1, 5, 8-12, 14-18, 25, 26, 28, 30 and 31 are rejected under 35 U.S.C. §103(a) as being unpatentable over Khan et al. (U.S. Patent No. 6,134,856).

(C) Claim 13 is rejected under 35 U.S.C. §103(a) as being unpatentable over Khan et al. in view of Robinson (U.S. Patent No. 4,695,501).

(D) Claims 27 and 29 are rejected under 35 U.S.C. §103(a) as being unpatentable over Khan et al. in view of Vanderzee (U.S. Patent No. 4,715,915).

(vii) Argument

(A) Claims 1, 8, 10, 12, 13, 15 and 25 are nonobvious over claim 1 of U.S. Patent No. 6,544,909.

According to the Examiner, these claims are substantially similar to claim 1 of the '909 patent. Appellants traverse this rejection for the following reasons. The Examiner has failed to establish a *prima facie* case of obviousness with respect to these claims. The Examiner has failed to carry its burden of showing why the claims are obvious over claim 1 of the '909 patent. Arguing that the claims are substantially similar to claim 1 of the '909 patent is insufficient to establish a *prima facie* case of obviousness.

Claim 1 of the '909 patent describes a single-ply reinforced roofing membrane having a reinforcement scrim sandwiched between two layers made of ethylene-butene copolymers wherein at least one of the layers includes a certain amount of maleic anhydride-modified polypropylene as an additive. The '909 patent fails to disclose or suggest a mechanically embossed single-ply roofing membrane wherein the bottom layer is mechanically embossed forming an embossment of alternating ridges and valleys as set forth in the claims of the pending application. The Examiner has failed to identify this limitation in the '909 reference or provide a motivation for modifying the '909 patent to obtain the claimed roofing membranes. Accordingly, Appellants respectfully submit that the obviousness-type double patenting rejection is improper and request that the rejection be reversed on appeal.

(B) Claims 1, 5, 8-12, 14-18, 25, 26, 28, 30 and 31 are nonobvious over U.S. Patent No. 6,134,856 to Khan et al.

Appellants respectfully submit that the Examiner has failed to establish a *prima facie* case of obviousness with respect to the rejected claims.

Factors to be evaluated in determining obviousness include "the scope and content of the prior art...differences between the prior art and claims at issue...and the level of ordinary skill in the pertinent art." *Graham v. John Deere Co.*, 383 U.S. 1 (1966). "A combination of familiar elements according to known methods is likely to be obvious when it does no more than yield

predictable results.” *KSR Int’l. v. Teleflex Inc.*, 127 S. Ct. 1727, 1731 (2007). However, “a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art.” *Id.* at 1741. A finding of obviousness must be based on more than “mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *Id. quoting In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006). All claim limitations must be identified in the cited references to establish a *prima facie* case of obviousness. *DyStar Textilfarben GmbH & Co. Deutschland KG v. C.H. Patrick Co.*, 464 F.3d 1356, 1360 (Fed. Cir. 2006).

Appellants submit that one of ordinary skill in the art would not have been motivated to modify the roll roof membrane of Khan such that the embossed selvage edges extend over a majority of the surface area of the bottom layer. Khan discloses a roll roof membrane comprising embossed selvage edges on opposite sides and opposite surfaces of the membrane. The embossed ridges and valleys in the selvage edges are adapted to accept adhesives thereby improving bonding between the overlapped portions of the membranes. However, as discussed in the last paragraph on page 2 of the pending application, the embossed selvage edges account for only a minor portion of the surface area of the membrane and fail to adequately resolve the roll-blocking problem addressed by certain embodiments of the present invention. There is no indication or suggestion in the Khan patent to emboss the majority of the surface area of the bottom layer to address roll blocking. The sole purpose of the embossed portions of the membrane described in the Khan patent is to provide additional surface area for accepting adhesive to improve bonding between overlapped membranes.

The Examiner simply indicates that it would have been obvious to increase the area of ridges and valleys “since it has been held that a mere duplication of the essential working parts of a device involves only routine skill in the art.” However, this conclusory statement fails to adequately address the issue of motivation to modify the Khan reference to obtain the present invention. Extending the embossed edges over a majority of the surface area of the bottom layer of the roll roof membrane has nothing to do with duplication of essential working parts of a

device. The embossed ridges and valleys in the selvage edges are adapted to accept adhesives thereby improving bonding between the overlap portions of the membranes. Furthermore, the embossed ridges and valleys are provided along a first selvage edge disposed in the top of the membrane and along a second selvage edge disposed in the bottom of the membrane. Modifying the Khan structure to relocate all of the ridges and valleys to the bottom of the membrane and have the ridges and valley extend over a majority of the surface area of the bottom layer would destroy the disclosed benefits associated with the Khan structure. One of ordinary skill in the art would never consider extending the ridges and valleys across a majority of the surface area of the bottom layer because the purpose of the ridges and valleys is to provide improved bonding along the edges of the membrane. Appellants respectfully submit that the purported motivation set forth by the Examiner is insufficient to suggest modifying the Khan membrane to include embossment over a majority of the surface layer of the bottom layer. Accordingly, the Examiner has failed to articulate “reasoning with some rational underpinning to support the legal conclusion of obviousness.” Therefore, Appellants respectfully submit that the Examiner has failed to establish a *prima facie* case of obviousness and request that the rejection under 35 U.S.C. §103 be reversed.

(C) Claim 13 is nonobvious over Khan et al. in view of Robinson.

Robinson is relied on for the disclosure of an insulated material having polyolefins of various types. The Examiner contends that it would have been obvious to modify Khan by using such material since it is used as a flexible, insulative sheet. Appellants respectfully submit that the rejection over the combination of Khan and Robinson must fail for the same reasons as set forth above since the cited secondary reference fails to remedy the shortcomings of the Khan reference. Accordingly, Appellants respectfully submit that the rejection of claim 13 is improper and request that the rejection be reversed.

(D) Claims 27 and 29 are nonobvious over Khan in view of Vanderzee.

Vanderzee is relied on for the disclosure of a roofing material made by extrusion and calendaring. However, the disclosure in Vanderzee fails to remedy the shortcomings of the Khan reference with respect to the embossment over a majority of the surface layer of the bottom

layer. Therefore, Appellants respectfully submit that claims 27 and 29 are nonobvious over the combined teachings of the cited references and request that the rejections be reversed.

We hereby authorize the Commissioner under 37 C.F.R. § 1.136(a)(3) to treat any paper that is filed in this application which requires an extension of time as incorporating a request for such an extension. The Commissioner is authorized to charge any additional fees required or to credit any overpayment to Deposit Account No. 20-0809.

Respectfully submitted,

June 10, 2009

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(viii) Claims Appendix

1. A mechanically embossed single ply roofing membrane comprising: a top layer and a bottom layer permanently pressed into a single ply membrane wherein said bottom layer is mechanically embossed forming an embossment of alternating ridges and valleys over a majority of the surface area of the bottom layer.
5. The mechanically embossed single ply roofing membrane of claim 1 wherein said embossment is of randomly spaced thread configuration running longitudinally in said single ply roofing membrane.
8. The mechanically embossed single ply roofing membrane of claim 1 wherein said top layer and said bottom layer is of a polyolefin.
9. The mechanically embossed single ply roofing membrane of claim 8 wherein said polyolefin is selected from the group consisting of polyethylene, polypropylene, terpolymers of ethylene, propylene and diene monomers, ethylene-propylene copolymers, ethylene-butane copolymers, ethylene-hexane copolymers, ethylene-octane copolymers, propylene-C₄₋₈ alpha olefin copolymers, and metallocene polyolefins.
10. A mechanically embossed single ply roofing membrane comprising: a reinforcement scrim sandwiched between a top layer of polyolefin and a bottom layer of polyolefin permanently pressed into a single ply membrane wherein said bottom layer is mechanically embossed forming an embossment of alternating ridges and valleys over a majority of the surface area of the bottom layer.
11. The mechanically embossed single ply roofing membrane of claim 10 wherein said reinforcement scrim is of a material selected from the group consisting of fiberglass, polyester, fiberglass reinforced polyester, woven fabrics and non-woven fabrics.
12. The mechanically embossed single ply roofing membrane of claim 10 wherein about 0.5% to 20% w/w of a highly-flowable, functional polyolefin is incorporated into said top layer

or said bottom layer to improve adhesion between said reinforcement scrim and said top layer and said bottom layer.

13. The mechanically embossed single ply roofing membrane of claim 12 wherein said highly-flowable, functional polyolefin is selected from the group consisting of maleic anhydride-modified polyolefin, epoxy-modified polyethylene and methacrylate terpolymers thereof.

14. The mechanically embossed single ply roofing membrane of claim 10 having a thickness of about 0.1 to 5 mm (4 to 200 mils).

15. The mechanically embossed single ply roofing membrane of claim 14 having a thickness of about 0.6 to 2.5 mm (25 to 100 mils).

16. The mechanically embossed single ply roofing membrane of claim 14 wherein said scrim having tenacity of 100 to 3000 denier.

17. The mechanically embossed single ply roofing membrane of claim 14 having a tensile strength of at least 80 pounds force per inch.

18. The mechanically embossed single ply roofing membrane of claim 1 wherein said embossment having a depth of about 0.01 to 2 mm (0.4 to 80 mils).

22. The mechanically embossed single ply roofing membrane of claim 10 wherein said embossment is of randomly spaced thread configuration running longitudinally in said single ply roofing membrane.

25. The mechanically embossed single ply roofing membrane of claim 10 wherein said polyolefin is selected from the group consisting of polyethylene, polypropylene, terpolymers of ethylene, propylene and diene monomers, ethylene-propylene copolymers, ethylene-butane copolymers, ethylene-hexane copolymers, ethylene-octane copolymers, propylene-C₄₋₈ alpha olefin copolymers, and metallocene polyolefins.

26. A method of making a mechanically embossed reinforced single ply roofing membrane comprising:

providing a scrim or reinforcement sheet having top and bottom surfaces;

depositing a coating in a molten state on said top and bottom surfaces of said scrim or reinforcement sheet;

embossing said bottom surface with a pattern of ridges and valleys over a majority of the surface area of the bottom layer; and

solidifying the molten coating on the top and bottom surfaces of said scrim or reinforcement sheet.

27. A method of making a mechanically embossed non-reinforced single ply roofing membrane comprising:

extruding and calendering a molten polyolefin sheet

embossing a majority of the bottom surface of said non-reinforced sheet with a pattern of ridges and valleys; and

solidifying the molten non-reinforced sheet.

28. The method of claim 26 wherein said coating is a polyolefin.

29. The method of claim 27 wherein said sheet further comprises a functional polyolefin.

30. A method of installing a mechanically embossed single ply roofing membrane on a roof deck comprising the steps of:

providing the roofing membrane of claim 1 in a roll form;

unrolling a desired length of said roofing membrane at the site of installation;

fully adhering or mechanically attaching the single ply roofing membrane on a roof deck;
and

continuing the process to complete the coverage of the roof deck.

31. A method of installing a mechanically embossed single ply roofing membrane on a roof deck comprising the steps of:

providing the roofing membrane of claim 10 in a roll form;
unrolling a desired length of said roofing membrane at the site of installation;
fully adhering or mechanically attaching the single ply roofing membrane on a roof deck;
and
continuing the process to complete the coverage of the roof deck.

(ix) Evidence Appendix

None.

(x) Related Proceedings Appendix

None.